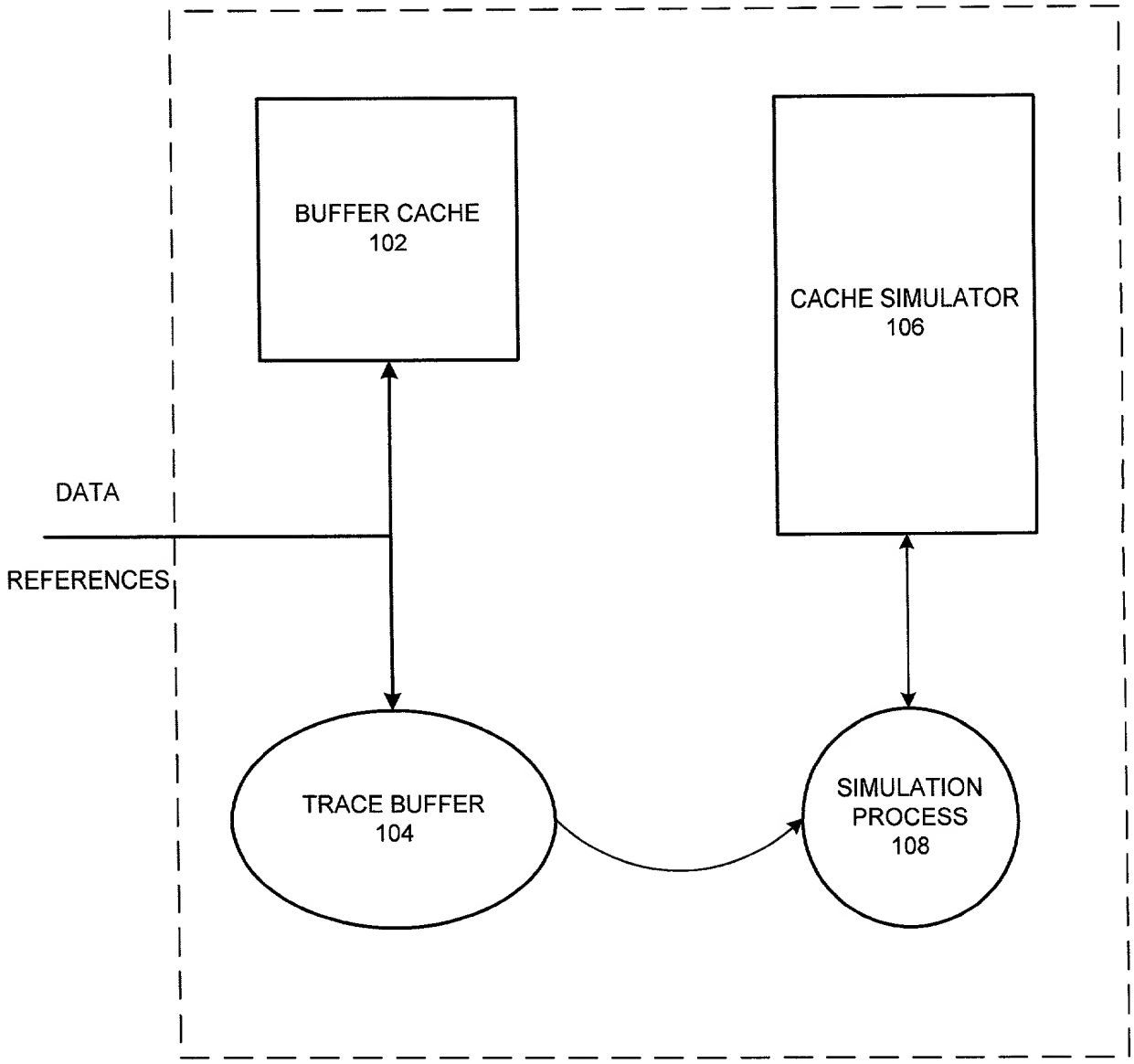

CACHE SIMULATION SYSTEM 100

FIG. 1

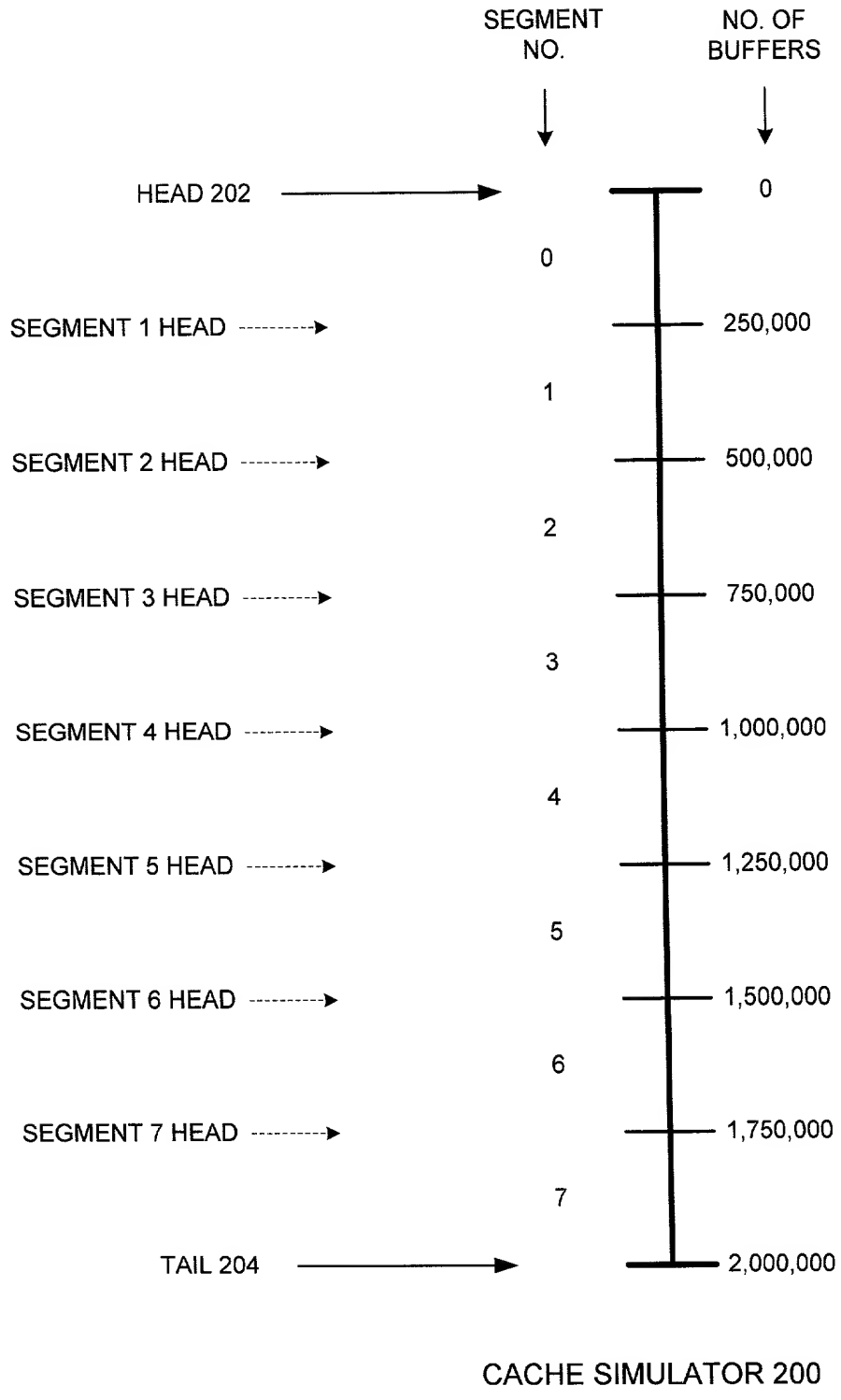
SEGMENT NO.
NO. OF BUFFERS
HEAD 202
0
0
SEGMENT 1 HEAD
250,000
1
SEGMENT 2 HEAD
500,000
2
SEGMENT 3 HEAD
750,000
3
SEGMENT 4 HEAD
1,000,000
4
SEGMENT 5 HEAD
1,250,000
5
SEGMENT 6 HEAD
1,500,000
6
SEGMENT 7 HEAD
1,750,000
7
TAIL 204
2,000,000
CACHE SIMULATOR 200

FIG. 2

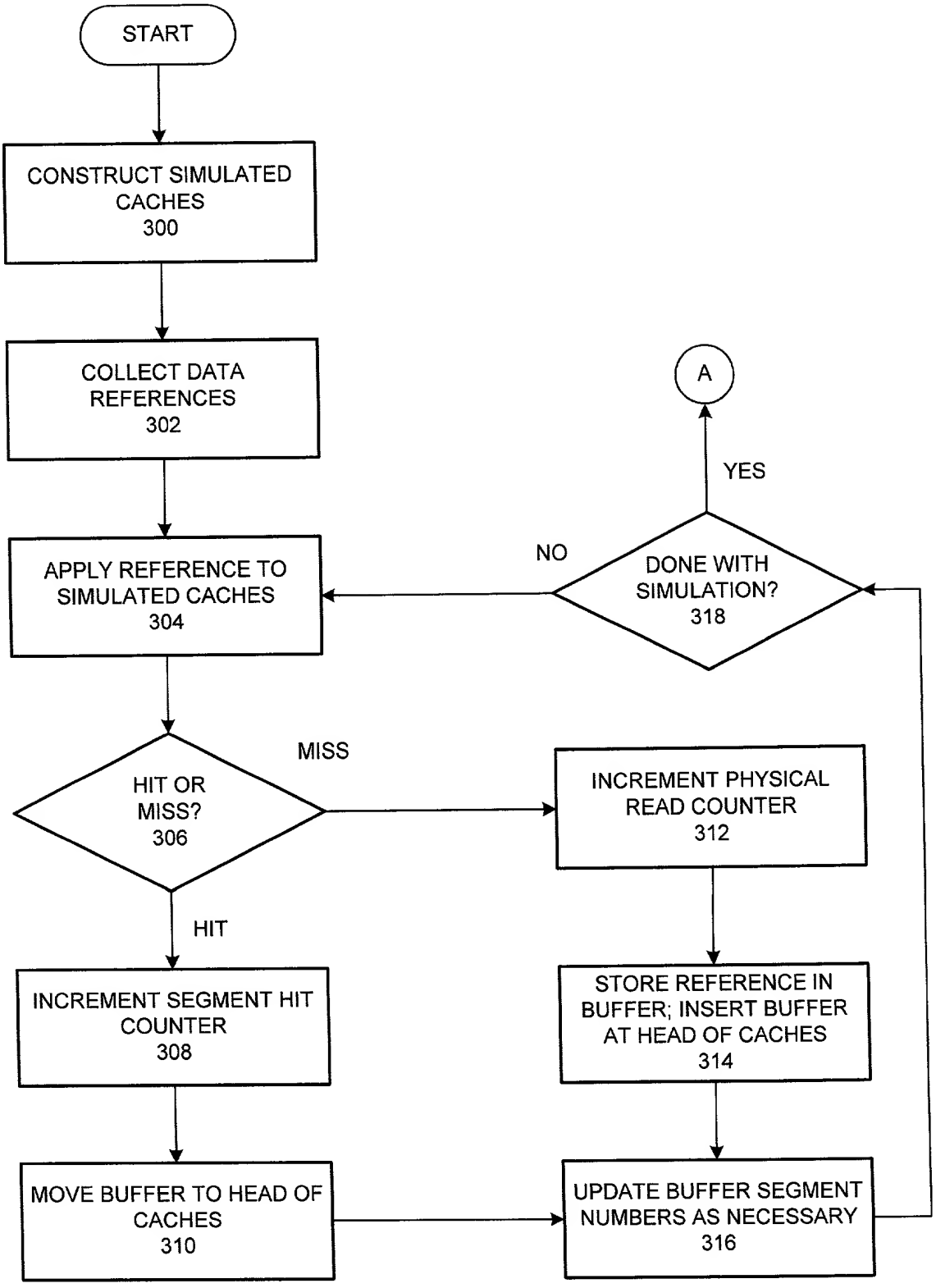
START
CONSTRUCT SIMULATED CACHES 300
COLLECT DATA REFERENCES 302
APPLY REFERENCE TO SIMULATED CACHES 304
HIT OR MISS? 306
MISS
HIT
INCREMENT SEGMENT HIT COUNTER 308
MOVE BUFFER TO HEAD OF CACHES 310
INCREMENT PHYSICAL READ COUNTER 312
STORE REFERENCE IN BUFFER; INSERT BUFFER AT HEAD OF CACHES 314
UPDATE BUFFER SEGMENT NUMBERS AS NECESSARY 316
DONE WITH SIMULATION? 318
NO
YES
A

FIG. 3A

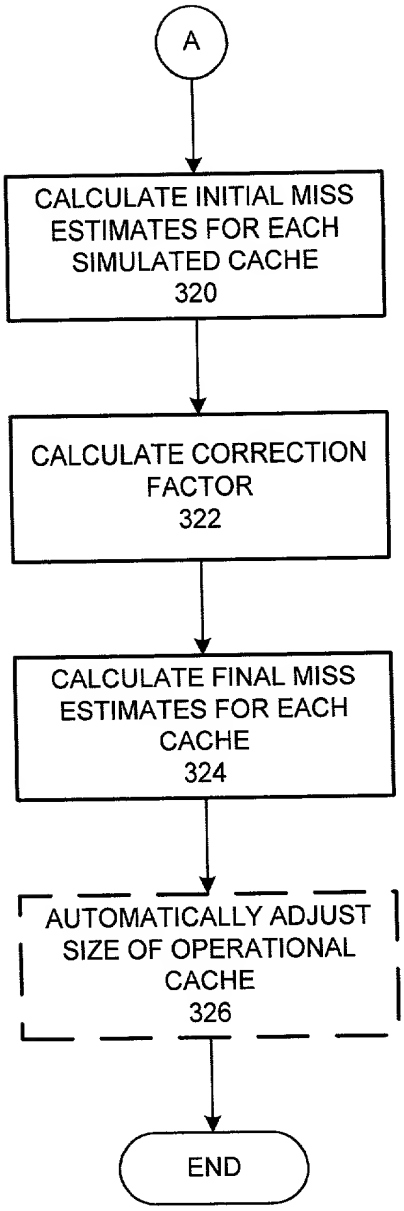
A
CALCULATE INITIAL MISS ESTIMATES FOR EACH SIMULATED CACHE
320
CALCULATE CORRECTION FACTOR
322
CALCULATE FINAL MISS ESTIMATES FOR EACH CACHE
324
AUTOMATICALLY ADJUST SIZE OF OPERATIONAL CACHE
326
END

FIG. 3B

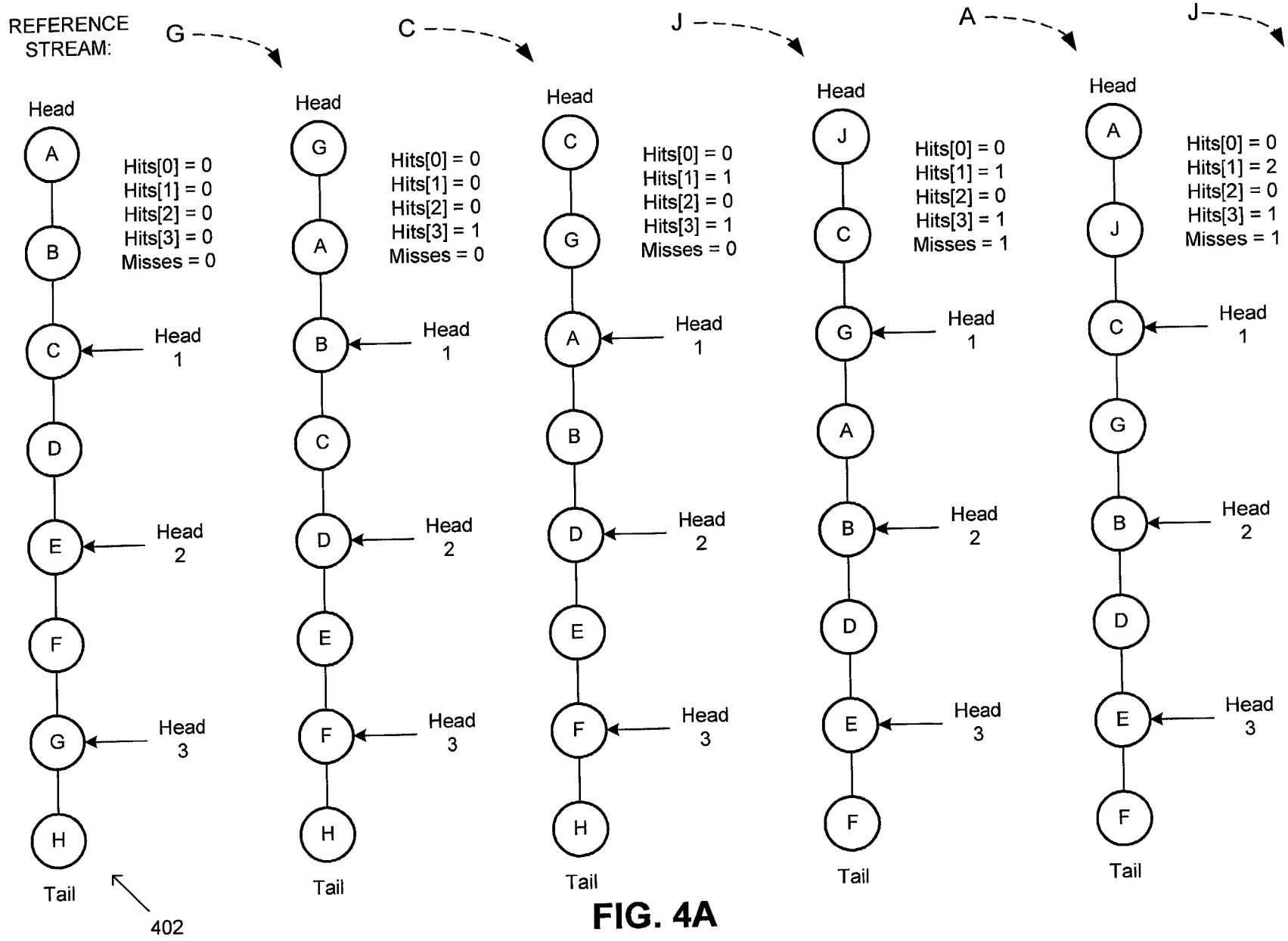
REFERENCE STREAM:
G
C
J
A
J
Head
A
B
C
D
E
F
G
H
Tail
Hits[0] = 0
Hits[1] = 0
Hits[2] = 0
Hits[3] = 0
Misses = 0
Head 1
Head 2
Head 3
402
Hits[0] = 0
Hits[1] = 0
Hits[2] = 0
Hits[3] = 1
Misses = 0
Hits[0] = 0
Hits[1] = 1
Hits[2] = 0
Hits[3] = 1
Misses = 0
Hits[0] = 0
Hits[1] = 1
Hits[2] = 0
Hits[3] = 1
Misses = 1
Hits[0] = 0
Hits[1] = 2
Hits[2] = 0
Hits[3] = 1
Misses = 1

FIG. 4A

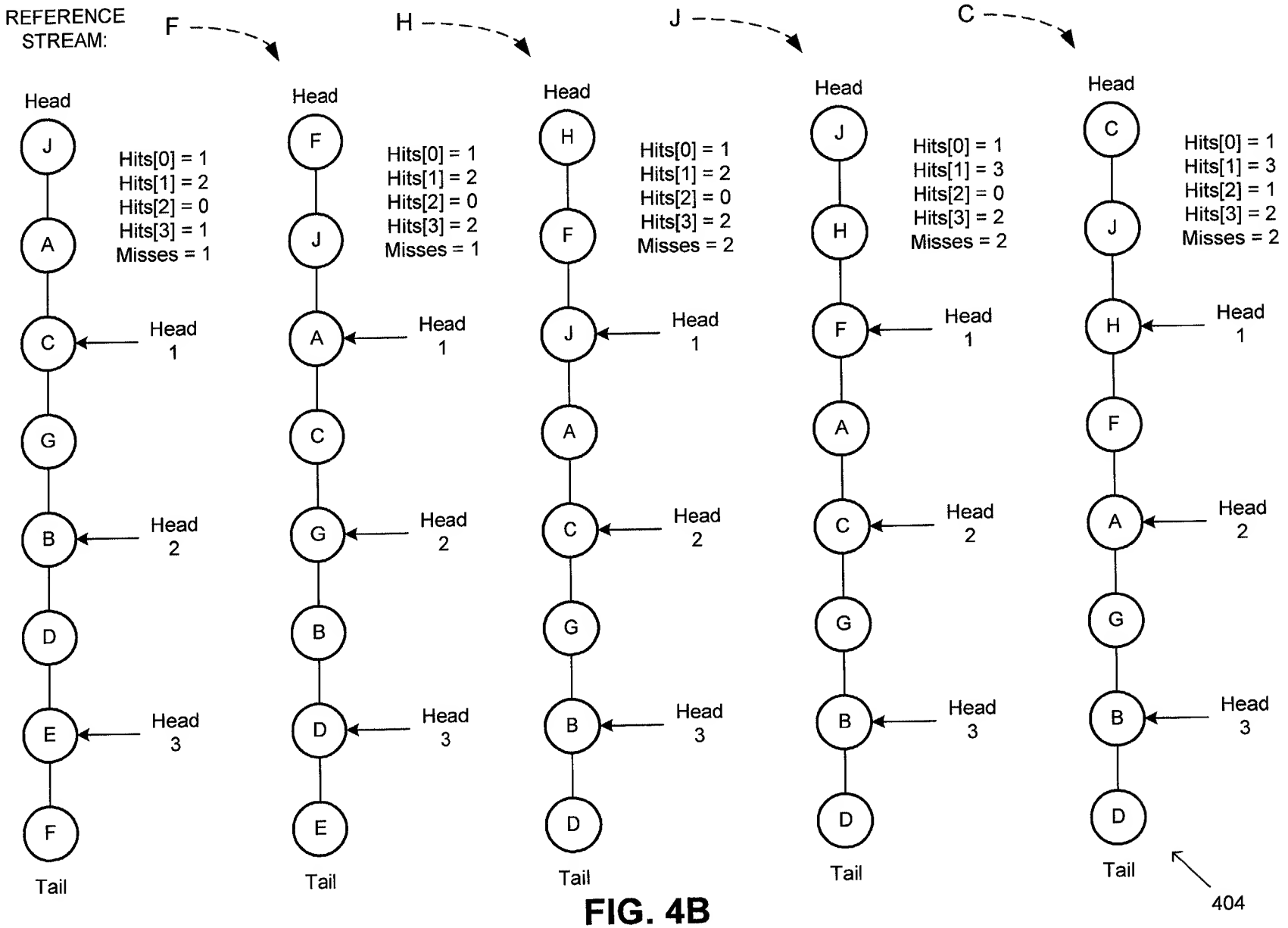
REFERENCE STREAM:
F
H
J
C
Head
Tail
Hits[0] = 1
Hits[1] = 2
Hits[2] = 0
Hits[3] = 1
Misses = 1
Hits[0] = 1
Hits[1] = 2
Hits[2] = 0
Hits[3] = 2
Misses = 1
Hits[0] = 1
Hits[1] = 2
Hits[2] = 0
Hits[3] = 2
Misses = 2
Hits[0] = 1
Hits[1] = 3
Hits[2] = 0
Hits[3] = 2
Misses = 2
Hits[0] = 1
Hits[1] = 3
Hits[2] = 1
Hits[3] = 2
Misses = 2
Head 1
Head 2
Head 3
404

FIG. 4B